Returnee's Report

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Program Report

<Program Contents>

The erectrophoretic deposition (EPD) process is one of promising techniques to assemble inorganic or organic particles from colloidal suspensions. The EPD process relies on an electric-field inducing deposition of electrically charged particles in an ordered manner on a substrate to develop thin and thick films in suspension. Even though many different kinds of polymers have been synthesized, their properties characterized, and used in commercial applications, polyesters still constitute a useful class of polymers. Specifically, the biodegradable polyesters such as polylacticacid (PLA), poly(□-caprolactone) (PCL) have been studied and used extensively for the biomedical applications due to their natural occurrence, proven biocompatibility. In this work we prepared nano-bioglass/biodegradable polyesters composite coating on steel substrate by EPD in ethanol and dimethyl carbonate (DMC) suspensions. By coating with plastic polymer layer (PCL and PLA), we could form nano-bioglass/biodegradable polyester (inorganic/organic) composite films on the metal substrate.

<Achievements/Ambitions>

The results show that nano-bioglass/ the biodegradable polyesters such as PLA, PCL composite coatings were obtained by EPD when the concentration of polyesters in the suspensions was 6 g/l. The nano-bioglass particles were positively charged in the ethanol and DMC mixed medium, moving towards the cathode under influence of the electric field and depositing there. Based on this training, nano-bioglass/biodegradable polyesters composites , we will do fabrication of novel bone regeneration materials with a view to bio-medical applications.

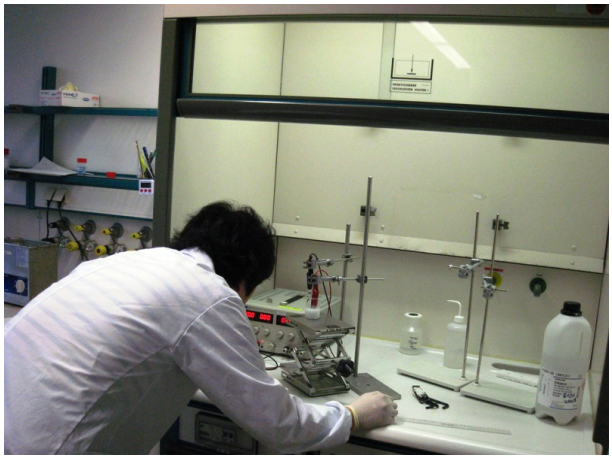

Figure 1. Experimental Procedure of Erectrophoretic Deposition.

Figure 2. German Memory with Prof. Aldo.

Figure 3. German Memory with laboratory members at Christmas market in Erlangen.